



August 16, 2019

Mr. McKenzie Mallary
Remedial Project Manager
U.S. EPA
61 Forsyth Street SW
Atlanta, GA 30303-3104

Mr. Joel P. Padgett, P.G., Geologist/Hydrologist III
Federal Remediation Section
Division of Site Assessment and Remediation
Bureau of Land and Waste Management
South Carolina Department of Health and Environmental Control
2600 Bull Street
Columbia, SC 29201

**RE: Request for Well Abandonment Approval
Dominion Energy South Carolina, Inc.
Calhoun Park Area Site
Charleston, South Carolina**

Dear Mr. Mallary and Mr. Padgett:

On behalf of Dominion Energy South Carolina, Inc. (DESC), this request is submitted for approval to abandon nine intermediate groundwater monitoring wells (BM-6C, BM-07B, BM-07C, CM-06D, LM-09B, MM-13B, MM-16B, PM-02B, and PM-03B) located at various locations on and adjacent to the Calhoun Park Area (CPA) site in Charleston, South Carolina. The monitoring wells to be abandoned were installed as part of the CPA site investigation program. The locations of the nine wells are shown on Figure 1. Table 1 list each well and provides location, intermediate sand unit screened, total depth and screened interval. Attachment A provides the boring logs and well construction diagrams.

WELL AND INJECTOR ABANDONMENT JUSTIFICATION

Following SCDHEC approval of the intermediate groundwater report for the December 2018 event (SCDHEC letter dated June 20, 2019), the wells proposed for abandonment are no longer part of the intermediate groundwater monitoring program and are not used in the current DNAPL monitoring program. Optimization of the monitoring programs is consistent with the objectives of the five-year review process and the draft recommendations from the current review. Abandonment of these nine wells will not have an adverse impact on the current intermediate groundwater monitoring program for the following reasons:

- None of the wells are included in the current intermediate groundwater monitoring program.
- The remaining wells are adequate to develop groundwater contour patterns since the wells proposed for abandonment are located at intermediate sand unit boundaries or in areas of adequate well density. In addition, groundwater contour patterns are generally well understood due to the historical information gained over more than a decade of monitoring.
- DNAPL accumulation has not been observed in these wells, and they are not part of the site-wide DNAPL monitoring and removal program.



ABANDONMENT PROCEDURES

The wells will be abandoned by injecting a high solids bentonite, neat cement, or cement/bentonite grout from the bottom of the well/injector to ground surface in accordance with SCDHEC requirements R.61-71. The work will be completed by a licensed South Carolina driller.

Water generated from the abandonment will be collected and transferred to the on-site storage tank for future disposal. Well casings and other debris will be placed in the on-site dumpster and disposed of properly. The well locations will be restored using material similar to that currently surrounding the well (e.g., asphalt, concrete, soil and seed).

Each well is accessible except for PM-03B. Well PM-03B is located on the South Carolina Ports Authority property and was covered when the area was resurfaced with asphalt. An attempt will be made to locate this well via measuring from known points and using a metal detector to assess location. If a definitive response is obtained with the metal detector, investigative means will be utilized to confirm the presence of the concrete pad and/or protective flush mount cover. If located, a sufficient amount of the asphalt surface will be removed to permit abandonment of the well.

SCHEDULE

DESC will make arrangements to abandon these monitoring wells following receipt of your approval. Upon completion of the fieldwork, well abandonment forms will be completed by the driller and forwarded to SCDHEC.

We appreciate your assistance in this matter. Should you have any questions, please contact me at (412) 829-9650.

Sincerely,
Apex Companies, LLC



William J. Zeli, P.E.
Environmental Program Manager

cc: P. Biery, T. Effinger, R. Contrael – DESC

Attachments

- A Figures and Tables
- B Boring Logs and Monitoring Well Construction Diagrams

ATTACHMENT A
FIGURES AND TABLES

Figure 1 Intermediate Groundwater Monitoring Locations Proposed for Abandonment (July 2019)

Table 1 Proposed Well Abandonment Location, Intermediate Sand, Total Depth and Screened Interval

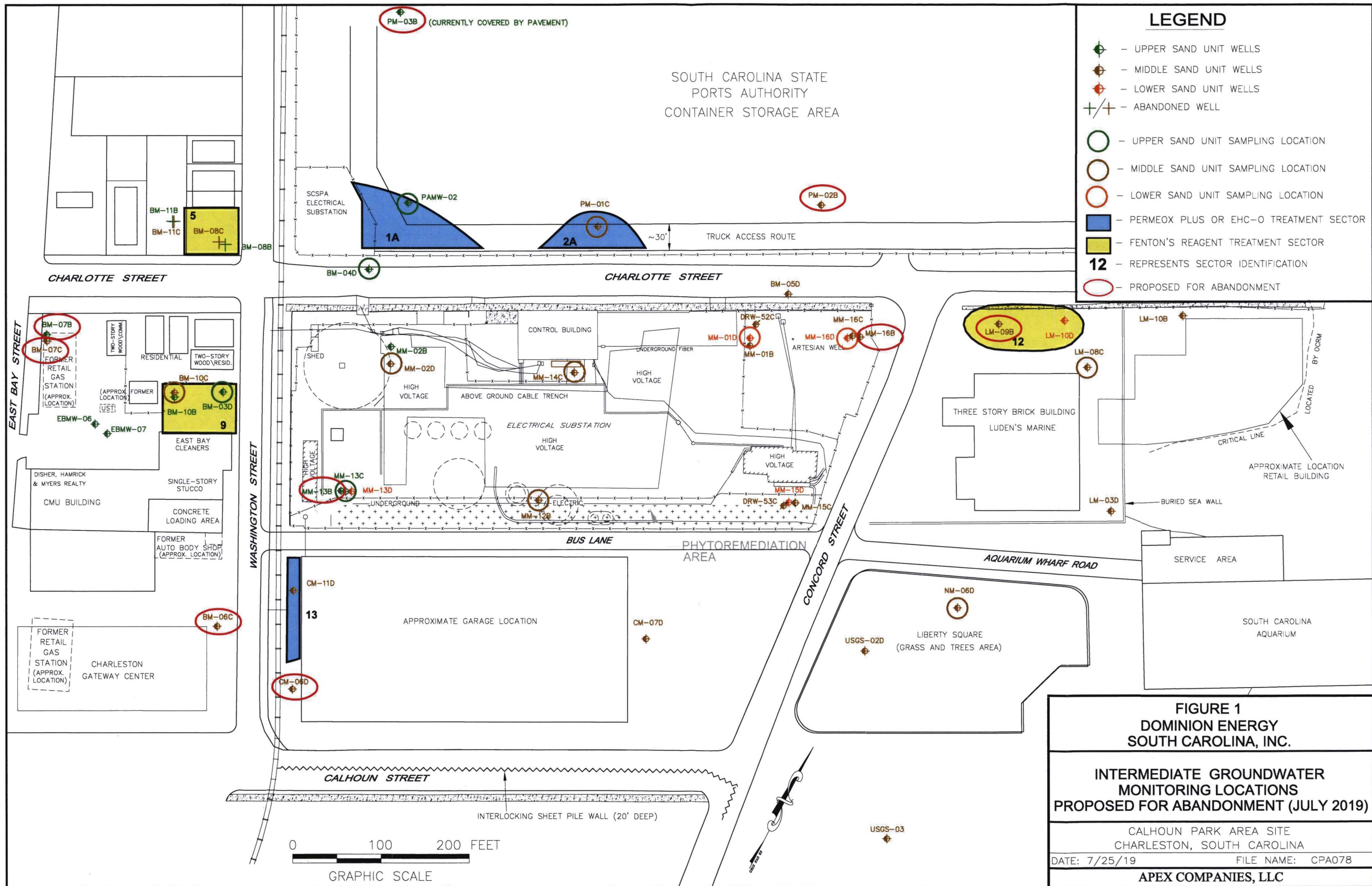


TABLE 1**PROPOSED WELL ABANDONMENT
LOCATION, INTERMEDIATE SAND, TOTAL DEPTH AND SCREENED INTERVAL****DESC Calhoun Park Area Site
Charleston, South Carolina**

Well⁽¹⁾	Site Location	Intermediate Sand Unit	Total depth (feet bgs)⁽²⁾	Screened Interval (feet bgs)⁽³⁾
BM-06C	Rivers	Middle Sand	45.27	38.0 - 48.0
BM-07B	East Bay Shops	Upper Sand	33.84	29.0 - 34.0
BM-07C	East Bay Shops	Middle Sand	48.62	38.0 - 48.0
CM-06D	CPA Parking Garage	Middle Sand	52.20	39.0 - 52.0
LM-09B	Luden's	Middle Sand	31.08	24.0 - 34.0
MM-13B	MGP/substation	Upper Sand	24.97	20.0 - 25.0
MM-16B	MGP/substation	Middle Sand	40.95	29.0 - 39.0
PM-02B	Ports Authority	Middle Sand	39.56	35.0 - 40.0
PM-03B	Ports Authority	Upper Sand	32.53	22.5 - 32.5

Notes:

- (1) Each well is finished as a flush mount except MM-16B which is completed as a stick-up.
- (2) Well total depth are from measurements on December 12, 2018 except for PM-03D which was last made on June 5, 2017 since this well was asphalted over, and LM-09B on September 22, 2016 since a car is typically parked over this well.
- (3) Screened intervals from well construction diagrams.

ATTACHMENT B
BORING LOGS AND WELL CONSTRUCTION DIAGRAMS

MTR		Well Completion Log Monitoring Well BM-06C		Intermediate Remedial Pre-Design Characterization SCE&G CPA Site Management and Technical Resources, Inc.	
Total Depth:	48.0 ft. bgs	Casing installation observed by:	D. Wingerd	Casing Drilling Method:	8 1/4-inch I.D. hollow stem augers (HSA)
Date Started:	08/08/01	Casing installed by:	R. Fowler, Cert. No. 01315	Well Drilling Method:	Wash rotary w/ 5 1/8-inch bit/AW rod
Date Completed:	08/12/01	Well installation observed by:	D. Wingerd	Sampling Methods:	Split-spoon ³
Northing ¹ :	349,632.4	Well installed by:	D. Stack, Cert. No. 01142	Development Method:	Surge and pump
Easting ¹ :	2,329,141.4	Surveyed by:	W. K. Dickson, No. 000177	LS Elevation ² :	4.06 feet msl ²
		Well depth, feet TOC:	47.39	TOC Elevation ² :	3.87 feet msl ²
DEPTH (feet)	REC. (%)	PID (ppm)	DESCRIPTION	COMMENTS	
1	86%	0.0	0.5-1.2' light olive gray sandy CLAY w/ some gravel (sub-base), loose		
2			1.2-2.0' medium gray grading to grayish black SAND and GRAVEL w/ some clay, slightly firm		
3			2.0-2.4' dark gray clayey SAND, moderately firm, no odor		
4			2.4-2.5' red brick fragment, porous		
5	33%	0.3	2.5-2.65' dark gray clayey SAND, moderately firm, no odor		
6			2.65-3.0' olive gray very fine to fine SAND, well sorted, moist to wet, no odor		
7			3.0-3.45' olive gray CLAY w/ few shell fragments, no odor		
8			4.0-4.8' medium gray to brownish gray clayey SAND, moderately soft, wet, no odor		
9	55% 0% in BM-06a	0.0	4.8-5.3' medium gray to blackish gray CLAY and SHELLS w/ trace brick fragment, wet at base at ~5.0'		
10			8.0-8.4' dusky brown WOOD fragments w/ trace to little clay		
11			8.4-10.2' dark greenish gray CLAY, moderately soft, cohesive, slightly plastic		
12					
13	90% 0% in BM-06a	1.0	12.0-14.6' dark greenish gray to greenish black CLAY w/ trace wood fragments, soft, medium light gray very fine grained sand lens at 14.1'		
14					
15			14.6-15.6' CLAY A/A w/ trace to little very fine sand, trace wood fragments and brachiopod shells, moderately firm, slightly salty odor		
16					
17	95% 0% in BM-06a	10-15	16.0-19.8' CLAY A/A w/ trace wood fragments, soft to moderately soft, stale sulfur odor at 16-20'		
18					
19					
20					
21	75%	0.2	20.0-22.7' dark greenish gray CLAY, soft at 20.0-20.9' then becoming moderately soft to moderately firm		
22					

¹ State Plane Coordinates (NAD 83).

² Elevation datum is NAVD 88 that are based on mean low sea level (to convert to RI datum, add 0.98')

³ Lithology description from BM-06 Geoprobe borings completed 06/25/01 and 06/26/01, except for the interval from 48 to 50 feet bgs sampled on 08/12/01 using split-spoons during BM-06C well installation.

MTR			Well Completion Log Monitoring Well BM-06C (cont.)	Intermediate Remedial Pre-Design Characterization SCE&G CPA Site Management and Technical Resources, Inc.
DEPTH (feet)	REC. (%)	PID (ppm)	DESCRIPTION	COMMENTS
23			22.7-23.0' CLAY A/A w/ trace shell fragments and shells (pelecypods), trace wood fragments, strong anaerobic odor, acrid and sharp	
24			(Total depth of boring BM-06b at 24' on 06/26/2001)	
25	100%		24.0-25.2' medium bluish gray to medium gray CLAY, dull, moderately soft, anaerobic, sulfur-like, odor	
26			25.2-27.6' dark gray CLAY, firm and plastic, w/ little vegetation and trace pelecypods, vegetation - moderate yellowish brown in apparent laminations	
27			27.6-28.0' dark greenish gray CLAY A/A	
28				
29	100%	0.1	28.0-32.0' dark greenish gray CLAY, moderately soft, w/ trace vegetation, dull anaerobic, slightly sulfur, septic tank-like odor	
30				
31				
32				
33	91%	0.2	32.0-34.3' dark greenish gray to greenish black CLAY, moderately soft, massive	
34			34.3-35.65' A/A w/ trace to little vegetation, moderately firm becoming firm at 35.3-35.65', no odor throughout	
35				
36				
37	100%	0.2	36.0-37.2' dark greenish gray (5G 4/1) to slight greenish black CLAY	
38			37.2-37.6' sandy CLAY A/A	
39		0.1	37.6-38.5' dark greenish gray to olive gray clayey SAND w/ trace vegetation and wood fragments	
40			38.5-38.9' light olive gray very fine to fine SAND, well sorted, w/ trace large wood fragments, wet	
41	0%		38.9-40.0' medium bluish gray very fine to fine SAND, very well sorted	
42				
43				
44				
45	50%	0.0	44.0-44.4' light olive gray to olive gray very fine SAND, well sorted, wet, no odor	Well Total Depth 48' bgs
46			44.4-44.7' olive gray to olive black sandy CLAY	
47		0.0	44.7-45.2' dark yellowish brown to medium brown WOOD fragments w/ little clay	
48			45.2-46.0' medium dark gray to olive black very fine to fine SAND	
49	75% (spoil-spoon)		48.0-49.0' dark greenish gray clayey SAND and sandy CLAY	
50			49.0-49.5' dark green CLAY, slightly sandy w/ few shell fragments, firm	
			no sheen or odor observed while conducting wash rotary drilling to 48 feet bgs	

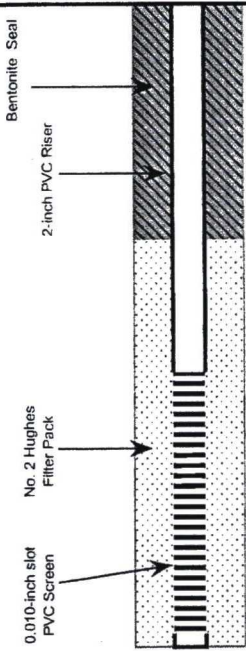
MTR		Well Completion Log Monitoring Well BM-06C (cont.)		Intermediate Remedial Pre-Design Characterization SCE&G CPA Site Management and Technical Resources, Inc.	
DEPTH (feet)	REC. (%)	PID (ppm)	DESCRIPTION	COMMENTS	
51	0% (Geoprobe boring BM-06a)			Casing: 20 feet PVC 6-inch diameter Portland cement w/ 5% bentonite	
52					
53	0%		(Geoprobe boring BM-06a)	Riser - 38 feet PVC 2-inch diameter Well screen - 10.0 feet PVC 0.010-inch slot Filter pack - No. 2 Hughes sand from 48.0 feet to 35.0 feet bgs (using tremie pipe to measure as well as clearing bridged sand) Annular seal - bentonite chips from 35.0 feet bgs to 33.0 feet bgs (using tremie pipe to measure as well as clearing bridged bentonite) DSI Easy Grout (high solids bentonite) from 33.0 feet bgs to top of 6-inch casing Casing and monitoring well installed using Mobile B-80 drilling rig, East Coast Drilling, Inc.	
54					
55					
56					
57	100%	0.0	56.0-58.8' dark greenish gray CLAY w/ trace shell fragments and trace sand 58.8-60.0' A/A w/ few to little shell fragments and trace to little sand		
58					
59					
60					
61	80%	0.0	60.0-60.8' medium bluish gray clayey SAND w/ some shell fragments 60.8-61.3' dark greenish gray CLAY, firm, w/ trace shell fragments 61.3-63.2' dark greenish gray very fine to fine SAND, well sorted w/ little silt and very fine shell fragments and trace clay		
62					
63					
64					
65			Total depth of boring BM-06a at 64' on June 25, 2001 Total depth of boring BM-06b at 20' on June 26, 2001 (interval from 8 to 20' bgs) Total depth of boring for monitoring well BM-06C terminated at 50' due to the presence of clay from 49 to 49.5 feet bgs Note: Waterra surge block/check valve assembly used in well BM-06C on August 12, 2001 to determine whether a sheen was present. After removing 30 gal, the surge block was lodged at the bottom of the well. Surge block length is 0.33 feet.		
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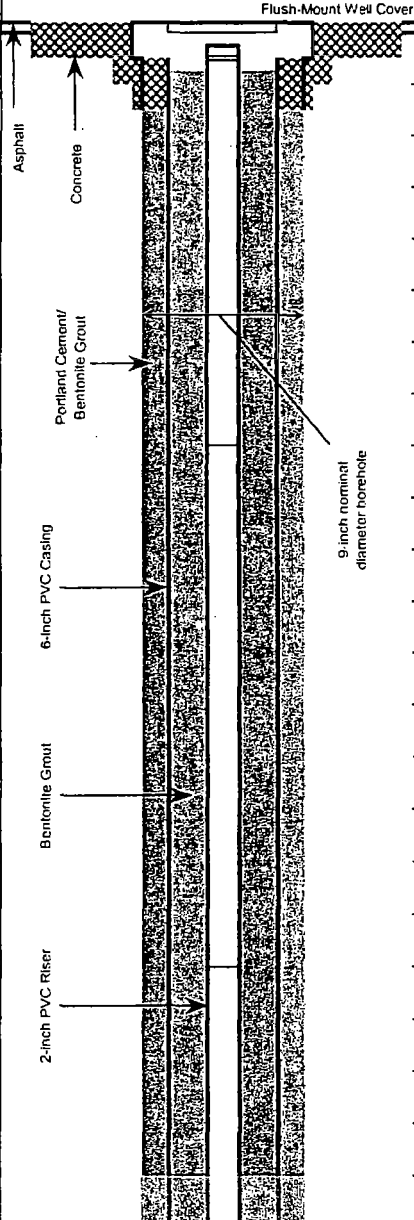
MTR		Well Completion Log Monitoring Well BM-07B		Intermediate Remedial Pre-Design Characterization SCE&G CPA Site Management and Technical Resources, Inc.	
Total Depth:	34.0 ft. bgs	Casing installation observed by:	N/A	Casing Drilling Method:	N/A
Date Started:	08/14/01	Casing installed by:	N/A	Well Drilling Method:	Wash rotary w/ 5 ⁷ / ₈ -inch bit/AW rod
Date Completed:	08/14/01	Well installation observed by:	D. Wingerd	Sampling Methods:	Split-spoon ³
Northing ¹ :	349,832.4	Well installed by:	D. Stack, Cert. No. 01142	Development Method:	Surge and pump
Easting ¹ :	2,328,815.9	Surveyed by:	W. K. Dickson No. 000177	LS Elevation ² :	8.11 feet msl ²
		Well depth, feet TOC:	34.05	TOC Elevation ² :	7.89 feet msl ²
DEPTH (feet)	REC. (%)	PID (ppm)	DESCRIPTION	COMMENTS	
1			0.0-0.2' asphalt		
2			0.2-3.0' moderate to dark yellowish brown fine grained SAND, well sorted w/ subbase at 0.2-0.4', dry to damp (hand clear from 0.0 to 3.0')		
3					
4	100%	0.0	3.0-4.0' moderate yellow brown fine grained SAND, well sorted, slightly firm, damp		
5	75%	0.2	4.0-4.6' dark yellowish brown very fine to fine grained SAND, well sorted, silty, loose		
6			4.6-5.1' grayish orange very fine to fine grained SAND, wet at 4.7'		
7			5.1-6.0' grayish orange to pale yellowish brown very fine grained SAND, silty, wet, no odor		
8			6.0-6.5' mottled pale yellowish brown and light brown very fine to fine grained SAND		
9	68%	0.1	6.5-7.0' SAND A/A, predominantly light brown w/ few to some clay (rolls into strand), wet		
10			8.0-9.2' grayish orange to dark yellowish orange very fine to fine grained SAND, well sorted, trace silt, moderately loose, wet, no odor		
11			9.2-9.3' transition from SAND A/A to:		
12			9.3-10.7' light olive gray very fine grained SAND, little to few clay, well sorted, moderately firm, wet, no odor		
13	88%	0.2	12.0-14.3' light olive gray to olive gray very fine to fine grained SAND, well sorted, wet to oversaturated		
14			14.3-14.7' pale green to grayish green very fine grained SAND		
15			14.7-15.5' moderate yellowish brown very fine to fine grained SAND, well sorted, wet		
16					
17	75%	0.2	16.0-16.8' dusky yellow green very fine to fine grained SAND, well sorted, oversaturated, no odor		
18			16.8-17.8' light brown very fine to fine grained SAND w/ few to some silt, moderately firm, no odor		
19			17.8-18.2' pale yellowish brown CLAY w/ little very fine sand		
20			18.2-19.1' pale yellowish brown to moderate yellow brown fine grained SAND w/ silt laminations, no odor		
21	88%	0.3	20.0-22.5' dark yellowish orange to moderate yellow brown very fine to fine grained SAND, well sorted, wet, no odor		
22			22.5-23.0' SAND A/A w/ few to some clay as alternating layers		

¹ State Plane Coordinates (NAD 83)

² Elevation datum is NAVD 88 that are based on mean low sea level (to convert to RI datum, add 0.98')

³ Lithology description from BM-07 Geoprobe boring completed 06/21/01, except for the interval from 44 to 48 feet bgs sampled on 08/11/01 using split-spoons during BM-07C well installation

MTR			Well Completion Log Monitoring Well BM-07B (cont.)		Intermediate Remedial Pre-Design Characterization SCE&G CPA Site Management and Technical Resources, Inc.			
DEPTH (feet)	REC. (%)	PID (ppm)	DESCRIPTION		COMMENTS			
23			23.0-23.5' medium gray CLAY, plastic		 <p>Bentonite Seal</p> <p>2-inch PVC Riser</p> <p>No. 2 Hughes Filter Pack</p> <p>0.010-inch slot PVC Screen</p> <p>Well Total Depth 34' bgs</p>	Riser - 29 feet PVC 2-inch diameter Well screen - 5.0 feet PVC 0.010-inch slot Filter pack - No. 2 Hughes sand from 34 feet bgs to 26.5 feet bgs Annular seal - bentonite chips from 26.5 feet to 20 feet bgs to allow tremie of grout at 20' bgs DSI Easy Grout (high solids bentonite) from 20 feet bgs to < 1 foot bgs Monitoring well installed using Mobile B-80 drilling rig, East Coast Drilling, Inc.		
24								
25			80%	0.4			24.0-24.7' moderate yellowish brown to dark yellowish orange very fine grained SAND, well sorted, wet to oversaturated, no odor	
26							24.7-25.4' medium bluish gray CLAY, firm and stiff, no odor	
27	25.4-26.6' dark greenish gray very fine to fine grained SAND, few silt, wet, no odor							
28	26.6-27.2' greenish gray to medium light gray very fine grained SAND and SHELLS at 26.6 to 26.8' grading to SAND w/ some shell fragments and little to few clay							
29	100%	0.5	28.0-29.0' light gray to medium light gray fine grained SAND w/ some shell fragments to 28.4' and little shell fragments at 28.4-29.0'					
30			29.0-30.0' moderate yellow brown SAND w/ little shell fragments, soft to very soft, oversaturated					
31			30.0-32.0' grayish blue green to medium bluish gray very fine grained silty SAND, moderately soft, firm at base					
32								
33	85%	0.3	32.0-33.8' dark greenish gray to medium gray very fine grained SAND, w/ few to some silt and clay, trace to little shell fragments, soft, wet to oversaturated					
34			33.8-35.4' medium dark gray sandy CLAY, trace to little shell fragments, moderately firm to 34.6' then firm to 35.4'					
35								
36								
37	100%	0.9	36.0-37.75' dark gray grading to medium dark gray sandy CLAY, some to few silt, trace shells, moderately firm, no odor					
38			37.75-40.0' medium light gray to greenish blue green clayey SAND, moderately firm, no odor					
39								
40								
41	98%	1.2	40.0-41.4' medium to light olive gray SAND, very fine to fine grained, well sorted					
42			41.4-42.9' medium dark gray SAND, fine grained w/ little to few silt, firm					
43			42.9-43.9' SAND A/A w/ trace medium grained sand, trace coarse sand at 43.5-43.9', trace vegetation, trace anaerobic odor					
44								
45	0% (split-spoon)							
46								
47	88% (split-spoon)		46.0-47.75' medium gray fine grained SAND, trace heavy minerals, trace pebble, trace clay and wood at bottom					
48			Collected split-spoon sampling in BM-07C boring on 08/11/2001					
49	100%	0.0	48.0-49.9' medium dark gray CLAY, plastic and cohesive, slightly firm					
50			49.9-52.0' medium dark gray CLAY w/ few shells w/ interval of some shell fragments at base (51.5-52.0')					

MTR		Well Completion Log Monitoring Well BM-07C		Intermediate Remedial Pre-Design Characterization SCE&G CPA Site Management and Technical Resources, Inc.	
Total Depth:	48.0 ft. bgs	Casing installation observed by:	D. Wingerd	Casing Drilling Method:	Wash rotary w/ 9-inch bit/N rod
Date Started:	08/07/01	Casing installed by:	R. Fowler, Cert. No. 01315	Well Drilling Method:	Wash rotary w/ 5 ⁷ / ₈ -inch bit/AW rod
Date Completed:	08/11/01	Well installation observed by:	D. Wingerd	Sampling Methods:	Split-spoon ³
Northing ¹ :	349,826.1	Well installed by:	D. Stack, Cert. No. 01142	Development Method:	Surge and pump
Easting ¹ :	2,328,819.6	Surveyed by:	W. K. Dickson, No. 000177	LS Elevation ² :	8.00 feet msl ²
		Well depth, feet TOC:	48.75	TOC Elevation ² :	7.79 feet msl ²
DEPTH (feet)	REC. (%)	PID (ppm)	DESCRIPTION	COMMENTS	
1			0.0-0.2' asphalt		
2			0.2-3.0' moderate to dark yellowish brown fine grained SAND, well sorted w/ subbase at 0.2-0.4', dry to damp (hand clear from 0.0 to 3.0')		
3					
4	100%	0.0	3.0-4.0' moderate yellow brown fine grained SAND, well sorted, slightly firm, damp		
5	75%	0.2	4.0-4.6' dark yellowish brown very fine to fine grained SAND, well sorted, silty, loose		
6			4.6-5.1' grayish orange very fine to fine grained SAND, wet at 4.7'		
7			5.1-6.0' grayish orange to pale yellowish brown very fine SAND, silty, wet, no odor		
8			6.0-6.5' mottled pale yellowish brown and light brown very fine to fine grained SAND		
9	68%	0.1	6.5-7.0' SAND A/A, predominantly light brown w/ few to some clay (rolls into strand), wet		
10			8.0-9.2' grayish orange to dark yellowish orange very fine to fine grained SAND, well sorted, trace silt, moderately loose, wet, no odor		
11			9.2-9.3' transition from SAND A/A to:		
12			9.3-10.7' light olive gray very fine grained SAND, little to few clay, well sorted, moderately firm, wet, no odor		
13	88%	0.2	12.0-14.3' light olive gray to olive gray very fine to fine grained SAND, well sorted, wet to oversaturated		
14			14.3-14.7' pale green to grayish green very fine grained SAND		
15			14.7-15.5' moderate yellowish brown very fine to fine grained SAND, well sorted, wet		
16					
17	75%	0.2	16.0-16.8' dusky yellow green very fine to fine grained SAND, well sorted, oversaturated, no odor		
18			16.8-17.8' light brown very fine to fine grained SAND w/ few to some silt, moderately firm, no odor		
19			17.8-18.2' pale yellowish brown CLAY w/ little very fine grained sand		
20			18.2-19.1' pale yellowish brown to moderate yellow brown fine grained SAND w/ silt laminations, no odor		
21	88%	0.3	20.0-22.5' dark yellowish orange to moderate yellow brown very fine to fine grained SAND, well sorted, wet, no odor		
22					
			22.5-23.0' SAND A/A w/ few to some clay as alternating layers		

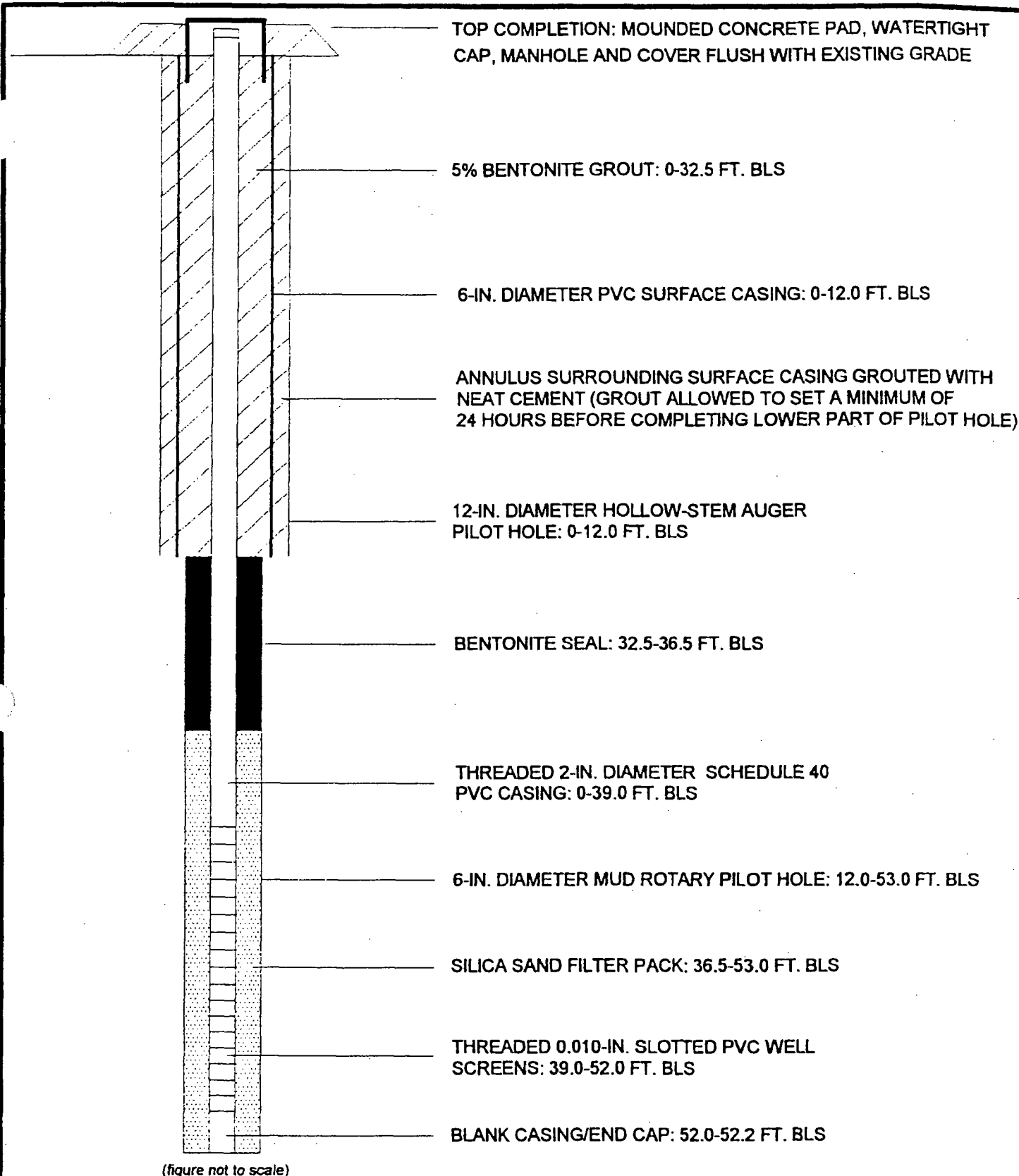
¹ State Plane Coordinates (NAD 83)

² Elevation datum is NAVD 88 that are based on mean low sea level (to convert to RI datum, add 0.98')

³ Lithology description from BM-07 Geoprobe boring completed 06/21/01, except for the interval from 44 to 48 feet bgs sampled on 08/11/01 using split-spoons during BM-07C well installation

MTR		Well Completion Log Monitoring Well BM-07C (cont.)		Intermediate Remedial Pre-Design Characterization SCE&G CPA Site Management and Technical Resources, Inc.	
DEPTH (feet)	REC. (%)	PID (ppm)	DESCRIPTION	COMMENTS	
23			23.0-23.5' medium gray CLAY, plastic	<p>Bentonite Grout</p> <p>Bentonite Seal</p> <p>6-inch PVC Casing</p> <p>2-inch PVC Riser</p> <p>No. 2 Hughes Filter Pack</p> <p>0.010-inch slot PVC Screen</p> <p>Well Total Depth 48' bgs</p>	
24					
25	80%	0.4	24.0-24.7' moderate yellowish brown to dark yellowish orange very fine grained SAND, well sorted, wet to oversaturated, no odor		
26			24.7-25.4' medium bluish gray CLAY, firm and stiff, no odor		
27			25.4-26.6' dark greenish gray very fine to fine grained SAND, few silt, wet, no odor		
28			26.6-27.2' greenish gray to medium light gray very fine grained SAND and SHELLS at 26.6 to 26.8' grading to SAND w/ some shell fragments and little to few clay		
29	100%	0.5	28.0-29.0' light gray to medium light gray fine grained SAND w/ some shell fragments to 28.4' and little shell fragments at 28.4-29.0'		
30			29.0-30.0' moderate yellow brown SAND w/ little shell fragments, soft to very soft, oversaturated		
31			30.0-32.0' grayish blue green to medium bluish gray very fine grained silty SAND, moderately soft, firm at base		
32			32.0-33.8' dark greenish gray to medium gray very fine grained SAND w/ few to some silt and clay, trace to little shell fragments, soft, wet to oversaturated		
33	85%	0.3			
34					33.8-35.4' medium dark gray sandy CLAY, trace to little shell fragments, moderately firm to 34.6' then firm to 35.4'
35					
36			36.0-37.75' dark gray grading to medium dark gray sandy CLAY, some to few silt, trace shells, moderately firm, no odor 37.75-40.0' medium light gray to greenish blue green clayey SAND, moderately firm, no odor		
37	100%	0.9			
38					
39					
40			40.0-41.4' medium to light olive gray very fine to fine SAND, well sorted 41.4-42.9' medium dark gray SAND, fine grained w/ little to few silt, firm 42.9-43.9' SAND A/A w/ trace medium grained sand, trace coarse sand at 43.5-43.9', trace vegetation, trace anaerobic odor		
41	98%	1.2			
42					
43					
44			Collected split-spoon sampling in BM-07C boring on 08/11/2001		
45	0% (split-spoon)				
46			46.0-47.75' medium gray fine grained SAND, trace heavy minerals, trace pebble, trace clay and wood at bottom		
47	88% (split-spoon)		Note: Drill to 48' w/ 5 7/8-inch bit		
48			48.0-49.9' medium dark gray CLAY, plastic and cohesive, slightly firm		
49	100%	0.0	49.9-52.0' medium dark gray CLAY w/ few shells w/ interval of some shell fragments at base (51.5-52.0')		
50					

MTR			Well Completion Log Monitoring Well BM-07C (cont.)	Intermediate Remedial Pre-Design Characterization SCE&G CPA Site Management and Technical Resources, Inc.
DEPTH (feet)	REC. (%)	PID (ppm)	DESCRIPTION	COMMENTS
51				Casing: 36 feet PVC 6-inch diameter Portland cement w/ 5% bentonite installed on 08/11/2001
52				
53				Riser - 38 feet PVC 2-inch diameter Well screen - 10.0 feet PVC 0.010-inch slot Filter pack - No. 2 Hughes sand from 48 feet bgs to 27.5 feet bgs Annular seal - bentonite chips from 27.5 to 25.0 feet bgs DSI Easy Grout (high solids bentonite) from 25.0 feet bgs to top of 6-inch casing
54				
55				
56				
57				Casing installed using Kelly drilling rig, East Coast Drilling, Inc. Monitoring well installed using Mobile B-80 drilling rig, East Coast Drilling, Inc.
58				
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AS-BUILT CONSTRUCTION DETAILS
INTERMEDIATE-ZONE MONITOR WELL CM-06D
CALHOUN PARK AREA SITE
CHARLESTON, SC

Godfrey and Associates Project No. 99101C-080



Geologic Log Monitor Well CM-06D

(Page 1 of 3)

SCE&G CPA Area Site

Godfrey and Associates, Inc.
Project No. 99101C-080

Total Depth: 55 ft.	Logged by: SCG, THC	Drilling Method: Auger, Mud Rotary
Date Started: 02/17/00	Drilled By: Geologic Exploration	Sampling Method(s): Direct Push /Spoons
Date Completed: 03/09/00	Surveyed by: W. K. Dickson	Analytical Sample(s): NA
Northing: 349609.3	Easting: 2329249.5	LS Elevation: 4.2 ft. msl

DEPTH (FT)	REC (%)	PID (PPM)	DESCRIPTION	COMMENTS
1	55	0.0	0.0 – 8.0 SAND (fill), traces brick, shell fragments, and gravel, dusky yellowish brown (10 YR 2/2), fine to coarse grained, poorly sorted, subangular to subrounded, damp to wet, no odor (SW).	0.0-10.0. Piston sampler 10.0-55.0 Split spoons
2				
3				
4				
5	68	11.0	BRICK FRAGMENTS, with sand as above.	
6				
7				
8	40	0.0	8.0 – 10.0 SILTY SANDY CLAY, trace tar blebs, hard, minor gravel, stiff, trace wood fragments, greenish black (5 GY 2/1), damp, slight septic odor (OL).	
9				
10	NS	-	10.0 - 39.5 CLAY, very soft with shell fragments and Sparse wood, sandy near top, grayish olive green (5 GY 3/2), wet, slight septic odor (CL).	Stopped at 10 ft. 2/17/00. Resumed at 10 ft. 3/9/00
11				
12	40	0.0		
13				
14	80	0.0	Firm below 15 feet, damp, slight septic odor.	
15				
16	100	0.0	Color change to olive gray (5 Y 3/2), moderate septic odor.	
17				
18	80	0.0	Moderate septic odor.	
19				
20				



Geologic Log Monitor Well CM-06D

(Page 2 of 3)

SCE&G CPA Area Site

Godfrey and Associates, Inc.

Project No. 99101C-080

Total Depth: 55 ft.	Logged by: SCG, THC	Drilling Method: Auger, Mud Rotary
Date Started: 02/17/00	Drilled By: Geologic Exploration	Sampling Method(s): Direct Push /Spoons
Date Completed: 03/09/00	Surveyed by: W. K. Dickson	Analytical Sample(s): NA
Northing: 349609.3	Easting: 2329249.5	LS Elevation: 4.2 ft. msl

DEPTH (FT)	REC (%)	PID (PPM)	DESCRIPTION	COMMENTS
21	0	-	No recovery. Soft clay smeared on outside of sampler.	
22				
23	40	0.0	Soft with abundant shells at 22-22.5 feet, moist, moderate septic odor.	
24				
25	NS	-	Firm to stiff, plastic, with sparse medium-grained sand At 25-27 feet, moist, moderate septic odor.	
26	90	0.0		
27				
28	100	0.1	Damp, slight septic odor.	
29				
30	100	0.3		
31				
32	80	0.0	Damp, moderate septic odor.	
33				
34	NS	-		
35	30	0.0	Damp, slight septic odor.	
36				
37	80	0.0		
38			Soft near base.	
39	NS	-		
40	70	0.0	39.5 - 44.3 SAND, with silty layers (see description, p. 3).	



Geologic Log Monitor Well CM-06D

(Page 3 of 3)

SCE&G CPA Area Site

Godfrey and Associates, Inc.

Project No. 99101C-080

Total Depth: 55 ft.	Logged by: SCG, THC	Drilling Method: Auger, Mud Rotary
Date Started: 02/17/00	Drilled By: Geologic Exploration	Sampling Method(s): Direct Push /Spoons
Date Completed: 03/09/00	Surveyed by: W. K. Dickson	Analytical Sample(s): NA
Northing: 349609.3	Easting: 2329249.5	LS Elevation: 4.2 ft. msl

DEPTH (FT)	REC (%)	PID (PPM)	DESCRIPTION	COMMENTS
41			39.5 – 44.3 SAND, downward coarsening, fine to medium grained, poorly sorted, subrounded, pale yellowish brown (10 YR 6/2), with thin dusky brown (5 YR 2/2) silty layers between 39.5 and 41 feet, saturated, no odor (SM).	
42	80	0.0		
43	NS	-		
44			Laminated and thinly bedded with only minor silt, medium to coarse grained, and well sorted below 41 feet.	
45	40	0.0	44.3 – 44.6 GRAVEL, quartzose with phosphates and sparse wood, pale yellowish brown (10 YR 6/2) with some moderate yellowish green (10 GY 6/4), rounded, poorly sorted, saturated, no odor. Clasts up to 3 mm (GP).	
46			44.6 – 47.3 SAND, as at 39.5 to 44.3 feet with phosphate gravels, pale yellowish brown, medium grained, poorly sorted, subrounded, saturated, no odor (SP).	
47	65	0.0		
48			47.3 – 48.5 GRAVEL and SAND, coarse, with abundant phosphates, very light gray (N8) to black (N1), poorly sorted, rounded, saturated, no odor. Clasts up to 20 mm (GP).	
49	NS	-		
50	50	0.0	48.5 – 52.2 SAND, silty, clayey, with shell fragments, grayish olive green (5 GY 3/2), medium grained, well sorted, subangular to subrounded, moist, no odor (SM).	
51			Increased clay content near base.	
52	65	0.0		
53			52.2 – 55.0 CLAY, silty, stiff to very stiff, grayish olive green (5 GY 3/2), dry to damp, no odor (CL).	
54	10	0.0	Total Depth: 55.0 ft. Well screened from 39.0 to 52.0 ft. bls	
55				
56				
57				
58				
59				
60				

Drilling Log

Monitoring Well LM-09B

Ludens

Project Luden's Investigation Owner South Carolina Electric & Gas Co.
 Location Charleston, SC Proj. No. 106154
 Surface Elev. 7.4 ft. Total Hole Depth 40 ft. Diameter 10 5/8 / 5 7/8 in.
 Top of Casing 6.98 ft. Water Level Initial 4.8 ft. Static 5.29 ft.
 Screen: Dia 2 in. Length 10 ft. Type/Size Stainless Steel/0.010 in.
 Casing: Dia 6 1/2 in. Length 18.0/23.0 ft. Type Carbon Steel/Stainless Steel
 Fill Material Silica Sand #2 Rig/Core Mobile Drill B-59/Geoprobe
 Drill Co. SAEDACCO Inc. Method H.S.A 4.25"/10.25" I.D./split-spoon/DPT/Mud Rotary
 Driller S. Poconiewicz Log By M. Shaheen Date 2/11-16/99 Permit # SF990011
 Checked By M. Shaheen License No. _____

See Site Map
For Boring Location

COMMENTS:

■ Indicates soil sample submitted for analysis. Latitude: 32° 47' 29.53" Longitude: 79° 55' 36.73" Groundwater elevation 3/8/99 2.10 feet MSL

Depth (ft.)	Well Completion	PID (ppm)	Sample ID Blow Count/ % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
-2						
0				HD	ASB SP	ASPHALT
2		11	11-12-7-7 25%			Light brown, fine to medium SAND, some gravel.
4		13	1-5-3-3 20%		GM	Medium gray SAND, SLAG, CINDER, BRICK and METAL. Low recovery, Fill; SAND, GRAVEL, brick fragments, no odor, moist.
6		13	3-3-2-25 30%			Low recovery, Fill same as above, mostly brick, moist, wet at 4.8', no sheen, no odor.
8		31	18-50/6 45%			Low recovery, brownish-gray SAND and GRAVEL, 0.2' wood on bottom of sampler, saturated, no sheen, no odor.
10		72	2-2-2-2 85%			SAND and GRAVEL same as above, wood at bottom 0.1' of sample, slight sheen and odor.
12		50	1-1-1-1 100%			Medium gray, lean CLAY, some wood and shells at top of interval, moist, soft, some tar-like material in shells and a few spots of tar in clay.
14			WOH 0%		CL	Medium gray, lean CLAY, soft, moist, no tar spots.
16		90	WOH 85%			No recovery, soft CLAY.
18		97	WOH 100%			Medium gray, lean CLAY, trace fine sand, some shells in thin interval at 16.0'.
20		86	WOH 100%		SM	CLAY same as above, trace to little fine sand.
						CLAY same as above.

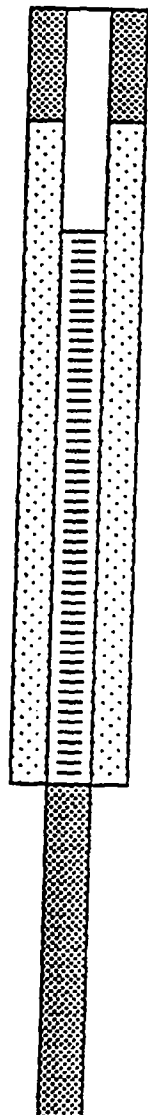








Drilling Log

Monitoring Well LM-09B

Project Luden's Investigation
Location Charleston, SC

Owner South Carolina Electric & Gas Co.

Proj. No. 106154

Depth (ft.)	Well Completion	PID (ppm)	Sample ID Blow Count/ % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
20		86	WOH% 100%		SM	Medium gray, silty fine SAND.
22		43	100%		CL	Medium gray, lean CLAY, soft, trace fine sand, wet, slight odor.
24					SP	Medium gray, fine SAND, saturated, loose.
26		102	100%		CL	Medium gray CLAY, soft, trace fine sand, slight odor, moist.
28					SM	Medium gray, silty, fine SAND, trace to some clay, saturated, some NAPL product, sheen, odor.
30		96	100%		SP	Medium gray, fine to medium SAND, trace shell fragments, trace NAPL and sheen to 34', thin 0.2' interval of clayey sand at 34 feet, sand also appears to be relatively denser at 34.0'-40.0' than sand above.
32					SC	
34		174	100%		SP	Sand same as above.
36						
38		33	100%			[Plugged bottom of sample borehole from 40.0'-26.0', with bentonite chips using tremie pipe prior to reaming borehole with mud-rotary for well installation]
40						End of Boring at 40 ft.
42						
44						
46						
48						

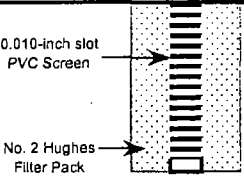
MTR		Well Completion Log Monitoring Well MM-13B		Intermediate Remedial Pre-Design Characterization SCE&G CPA Site Management and Technical Resources, Inc.	
Total Depth: 25 ft. bgs		Casing installation observed by: W. Zell		Casing Drilling Method: Wash rotary w/ 9-inch bit/N rod	
Date Started: 08/20/01		Casing installed: R. Fowler, Cert. No. 01315		Well Drilling Method: Wash rotary w/ 5 7/8-inch bit/AW rod	
Date Completed: 08/23/01		Well installation observed by: S. Ochs		Sampling Methods: Split-spoon ³	
Northing ¹ : 349,833.6		Well installed: R. Fowler, Cert. No. 01315		Development Method: Surge and pump	
Easting ¹ : 2,329,192.2		Surveyed by: W. K. Dickson, No. 000177		LS Elevation ² : 8.61 feet msl ²	
		Well depth, feet TOC: 25.10		TOC Elevation ² : 8.29 feet msl ²	

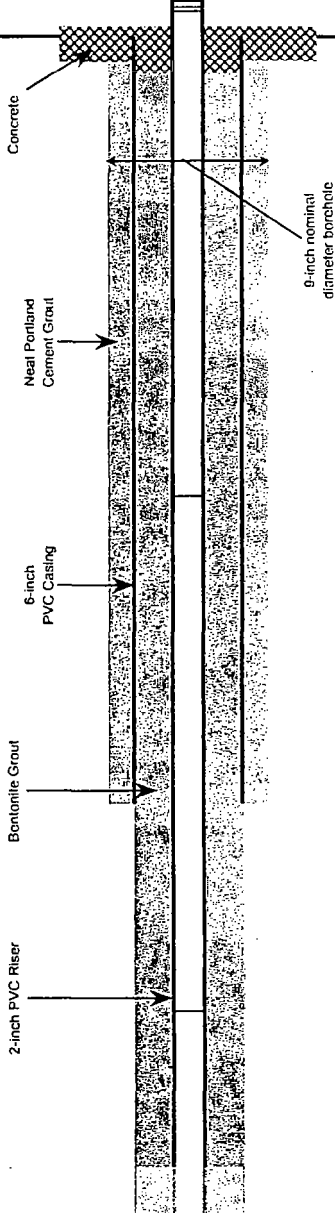
DEPTH (feet)	REC. (%)	PID (ppm)	DESCRIPTION	COMMENTS
1	0%		0-4' not sampled, based on logs for borings completed as part of cathodic protection boring program	
2				
3				
4				
5	0%		4-8' not sampled, based on logs for borings completed as part of cathodic protection boring program	
6				
7				
8				
9	63%	0.0	8.0-8.3' brownish black to greenish black SAND and GRAVEL (coke, coal and brick fragments), trace to few shell fragments 8.3-8.6' olive gray SAND w/ few clay 8.6-8.9' dark yellowish brown matted vegetation w/ trace clay - salty odor, anaerobic odor of vegetative decomposition 8.9-10.5' dark greenish gray to greenish black CLAY, moderately soft, trace to little vegetation - no odor	
10				
11				
12				
13	95%	0.0	12.0-15.8' greenish black CLAY, massive, moderately soft, trace vegetation - anaerobic odor	
14				
15				
16				
17	98%	1.5	16.0-19.65' CLAY A/A w/ trace to little sand at 16.0-16.5', plastic - no odor 19.65-19.9' olive gray to brownish gray SAND, very fine to medium grained, w/ few silt, firm and plastic - wet, no odor	
18				
19				
20				
21	100%	1 - 3	20.0-22.0' greenish gray to medium light gray SAND, very fine to fine grained, firm - wet, no odor	
22				

¹ State Plane Coordinates (NAD 83).

² Elevation datum is NAVD 88 that are based on mean low sea level (to convert to RI datum, add 0.98')

³ Lithology description from MM-13 Geoprobe boring completed 07/02/01, except for the interval from 48 to 64 feet bgs sampled on 08/22/01 using split-spoons during preliminary boring within the 10-inch casing of MM-13C

MTR		Well Completion Log Monitoring Well MM-13B (cont.)		Intermediate Remedial Pre-Design Characterization SCE&G CPA Site Management and Technical Resources, Inc.	
DEPTH (feet)	REC. (%)	PID (ppm)	DESCRIPTION	COMMENTS	
23			22.0-23.1' greenish gray very fine grained SAND, few silt and clay - oversaturated, no odor	 <p>0.010-inch slot PVC Screen</p> <p>No. 2 Hughes Filter Pack</p>	
24			23.1-23.35' greenish gray sandy CLAY, moderately firm		
25	100%		23.35-23.75' greenish gray fine to medium grained SAND 23.75-24.0' light olive to light olive brown fine grained SAND - faint odor at 24.0', slightly pine-like	Well Total Depth 25' bgs	
26		2.5 - 3.0	24.0-26.05' pale olive very fine to fine grained SAND, well sorted, very slightly silty, very firm		
27			- slight odor (indescript, potential MGP-like, organic odor)	Casing: 14 feet PVC 6-inch diameter neat Portland cement grout installed on 8/20/2001	
28			26.05-26.45' grayish green silty CLAY w/ little sand, mottled to olive brown - v. slight odor (indescript organic odor, , potential MGP-like)		
29	100%		26.45-28.0' greenish gray CLAY w/ trace sand, very firm and dense, mottled to olive brown (5Y 4/4)	Riser - 20 feet PVC 2-inch diameter Well screen - 5.0 feet PVC 0.010-inch slot Filter pack - No. 2 Hughes sand from 25 feet bgs to 18.0 feet bgs Annular seal - bentonite chips from 18.0 feet bgs to 17.0 feet bgs DSI Easy Grout (high solids bentonite) from 17.0 feet bgs to top of 6-inch casing	
30		50 - 60	28.0-29.65' pale olive CLAY, very firm, cohesive, very slight mottling w/ very small-moderate olive brown clay lenses, apparent bio- turbation - no odor		
31			29.65-30.75' grayish green to slight dusky green CLAY, firm, w/ very fine sand laminations (salt and pepper appearance)	Casings installed using Mobile B-80 drilling rig, East Coast Drilling, Inc. Monitoring well installed using CME-45 drilling rig, East Coast Drilling, Inc.	
32			30.75-31.25' greenish gray CLAY w/ little very fine sand		
33	95%		31.25-31.5' greenish gray CLAY and SHELLS, firm and plastic 31.5-31.8' moderate olive brown very fine to fine grained SAND - old gasoline odor at 31.5-31.8'		
34		70 - 80	32.0-32.6' light olive gray very fine grained SAND w/ trace shell fragments, firm - moist, old gasoline odor		
35			32.6-33.2' SAND A/A w/ some to few shells, firm - old gasoline odor		
36			33.2-34.3' mottled moderate olive brown to medium bluish gray clayey SAND, moderately firm to moderately soft w/ few to little shell fragments		
37	100%		34.3-34.5' moderate olive brown sandy CLAY		
38		25 - 30	34.5-36.0' moderate olive brown to medium bluish gray very fine grained clayey SAND, mottled - old gasoline-like odor		
39		60 - 70	36.0-37.05' medium gray CLAY w/ few light brown mottling, firm and dense - wet, pine-like odor, collect sample at 37-38', sheen		
40			37.05-38.0' medium light gray to greenish gray very fine grained SAND, moderately soft		
41	100%		38.0-38.5' pale olive SAND, w/ few clay - wet (fails to roll)		
42		4 - 7	38.5-38.8' pale olive sandy CLAY		
43			38.8-39.6' CLAY A/A, massive, dense		
44			39.6-40.0' light olive gray CLAY, very firm, dense, plastic - trace odor		
45	100%	0.0	40.0-41.8' medium dark gray CLAY, massive, dense, cohesive, and plastic - stale pine-like odor		
46			41.8-43.7' dark greenish gray very fine to fine SAND, well sorted, silty		
47			43.7-44.0' SAND A/A, fine to medium grained		
48			44.0-45.1' greenish gray (5G 6/1) to light gray SAND, very fine grained, silty - wet to 44.5' then oversaturated at 44.5-45.1' w/ trace stale odor		
49	50% (split- spoon)	1,420	45.1-45.9' SAND A/A, fine to medium grained, well sorted, trace heavy minerals		
50			45.9-47.5' SAND A/A, very fine to fine grained - trace stale odor 47.5-48.0' SAND A/A, fine to medium grained, well sorted, trace to little heavy minerals		
			48.0-49.0' medium gray SAND, very fine to fine grained, very well sorted, w/ trace sharp odor		
			split-spoon sampling in MM-13D borehole on 09/04/2001		

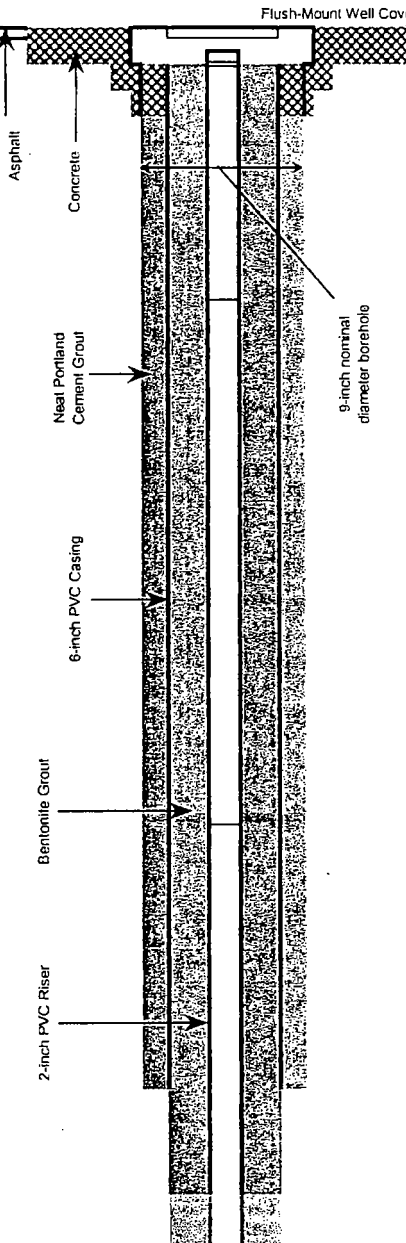
MTR		Well Completion Log Monitoring Well MM-16B		Intermediate Remedial Pre-Design Characterization SCE&G CPA Site Management and Technical Resources, Inc.	
Total Depth:	39.0 ft. bgs	Casing installation observed by: M. Babich	Casing Drilling Method:	Wash rotary w/ 9-inch bit/N rod	
Date Started:	08/14/01	Casing installed by: D. Stack, Cert. No. 01142	Well Drilling Method:	Wash rotary w/ 5 7/8-inch bit/AW rod	
Date Completed:	08/15/01	Well installation observed by: D. Wingerd	Sampling Methods:	Split-spoon ³	
Northing ¹ :	350,266.7	Well installed by D. Stack, Cert. No. 01142	Development Method:	Surge and pump	
Easting ¹ :	2,329,631.9	Surveyed by: W. K. Dickson, No. 000177	LS Elevation ² :	5.30 feet msl ²	
		Well depth, feet TOC: 41.08	TOC Elevation ² :	7.53 feet msl ²	
DEPTH (feet)	REC. (%)	PID (ppm)	DESCRIPTION		COMMENTS
1	0%		0-4' not sampled on 6/30/01 during DPT boring based on existing boring logs and Area 2 excavation records		
2					
3					
4					
5	0%		4-8' not sampled based on boring logs and Area 2 excavation records		
6					
7					
8					
9	0%		8-12' not sampled based on boring logs and Area 2 excavation records		
10					
11					
12					
13	85%	0.0	12.0-15.0' greenish black (5G 2/1) CLAY, soft at top becoming moderately firm at base, w/ sand lens at 12.75-12.8' <i>Note: DNAPL emulsion observed at 12 to 14 feet bgs while installing 6-inch casing in mud returns</i> 15.0-15.4' CLAY A/A w/ trace shells		
14					
15					
16					
17	85%	0.0	16.0-18.6' CLAY A/A w/ trace shell fragments at 16.8-17.4' 18.6-19.4' greenish black (5G 2/1) silty CLAY w/ trace very fine grained sand		
18					
19					
20					
21	100%	0.0	20.0-21.55' olive gray to greenish black (5Y 2/1) CLAY w/ few silt, very soft 21.55-21.65' olive gray to medium dark gray fine grained SAND 21.65-21.75' CLAY A/A 21.75-21.8' brownish black vegetation organic material		
22					

¹ State Plane Coordinates (NAD 83).

² Elevation datum is NAVD 88 that are based on mean low sea level (to convert to RI datum, add 0.98').

³ Lithology description from MM-16 Geoprobe boring completed 06/30/01 except for the interval sampled using split-spoons at 32 to 52 feet bgs during MM-16B well installation on 08/15/01 and MM-16C well installation on 08/31/01.

MTR			Well Completion Log Monitoring Well MM-16B (cont.)		Intermediate Remedial Pre-Design Characterization SCE&G CPA Site Management and Technical Resources, Inc.	
DEPTH (feet)	REC. (%)	PID (ppm)	DESCRIPTION			COMMENTS
51						DSI Easy Grout (high solids bentonite) from 25.0 feet bgs to top of 6-inch casing
52						Casing installed using Mobile B-80 drilling rig, East Coast Drilling, Inc. Monitoring well installed using CME-45 drilling rig, East Coast Drilling, Inc.
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MTR		Well Completion Log Monitoring Well PM-02B		Intermediate Remedial Pre-Design Characterization SCE&G CPA Site Management and Technical Resources, Inc.	
Total Depth:	40.0 ft. bgs	Casing installation observed by:	M. Babich	Casing Drilling Method:	Wash rotary w/ 9-inch bit/N rod
Date Started:	08/17/01	Casing installed by:	D. Stack, Cert. No. 01142	Well Drilling Method:	Wash rotary w/ 5 ⁷ / ₈ -inch bit/AW rod
Date Completed:	08/20/01	Well installation observed by:	D. Wingerd	Sampling Methods:	Split-spoon ³
Northing ¹ :	350,377.6	Well installed by:	R. Fowler, Cert. No. 01315	Development Method:	Surge and pump
Easting ¹ :	2,329,522.2	Surveyed by:	W. K. Dickson, No. 000177	LS Elevation ² :	6.06 feet msl ²
		Well depth, feet TOC:	39.91	TOC Elevation ² :	5.81 feet msl ²
DEPTH (feet)	REC. (%)	PID (ppm)	DESCRIPTION	COMMENTS	
1	96% (2.4 of 2.5')	1.0	(hand clear to 1.5')		
2			1.5-2.4' grayish black clayey SAND and some gravel, wet to moist, stale MGP-like odor		
3			2.4-2.95' dark gray grading to dark greenish gray silty CLAY, no odor		
4			2.95-3.25', 3.4-3.5' and 3.65-3.9' SHELLS and fine to medium grained SAND; alternating w/		
5	54%	0.5	3.25-3.4', 3.5-3.65' dark greenish gray to medium dark gray CLAY, moderately firm to firm		
6			4.0-5.2' dark greenish gray CLAY w/ little shells from 4.0-4.5', then trace to few shells		
7			5.2-5.75' dark greenish gray to medium dark gray clayey SAND w/ few to some shell fragments, gun metal gray sheen at 5.7'		
8			5.75-6.15' dark gray to grayish fine GRAVEL and some sand and little silt and clay, wet, gravel is coke and slag fragments		
9	85%	6.0	8.0-8.3' grayish black CLAY w/ few coal fragments, trace coal-like odor		
10			8.3-11.4' dark greenish gray (5G 4/1) to greenish black (5G 2/1) CLAY, soft, plastic, cohesive		
11					
12					
13	63%	1.5	12.0-14.5' dark greenish gray (5G 4/1) to greenish black (5G 2/1) CLAY w/ trace yellow wood fragments		
14					
15					
16					
17	100%	1.0	16.0-20.0' dark greenish gray (5G 4/1) to greenish black (5G 2/1) CLAY, little silt, trace sand, massive, soft, no odor		
18					
19					
20					
21	100%	3.0	20.0-22.7' CLAY A/A w/ trace sand, plastic, cohesive, no odor		
22					

¹ State Plane Coordinates (NAD 83).

² Elevation datum is NAVD 88 that are based on mean low sea level (to convert to RI datum, add 0.98')

³ Lithology description from PM-02 Geoprobe boring completed 06/26/01, except for the interval sampled from 34 to 40 feet bgs using split-spoons during well installation

MTR			Well Completion Log Monitoring Well PM-02B (cont.)	Intermediate Remedial Pre-Design Characterization SCE&G CPA Site Management and Technical Resources, Inc.
DEPTH (feet)	REC. (%)	PID (ppm)	DESCRIPTION	COMMENTS
23			22.7-24.0' dark greenish gray (5G 4/1) to greenish black CLAY, less sand, less cohesive than above, trace stale, aromatic-like odor	<p>Well Total Depth 40' bgs</p>
24				
25	100%	1.0	24.0-25.0' CLAY A/A w/ little sand, anaerobic salty odor	
26			25.0-27.8' dark greenish gray (5G 4/1) to greenish black sandy CLAY, moderately soft, cohesive	
27			27.8-28.0' dark greenish gray (5G 4/1) to greenish black clayey very fine to fine grained SAND, well sorted	
28				
29	63%	0.0	28.0-29.9' dark greenish gray (5GY 4/1) very fine to fine grained SAND, well sorted, trace silt, firm, oversaturated, no odor	
30			29.9-30.5' SAND A/A w/ little clay and silt, moderately soft, trace shells	
31			32.0-33.25' dark greenish gray (5G 4/1) very fine to fine grained SAND, well sorted, trace shell fragments	
32			33.25-33.45' dark gray CLAY, moderately soft	
33	93% (over 4 feet - DPT)	0.0	33.45-33.75' SAND A/A	
			33.75-34.15' CLAY A/A, no odor,	
34			34.15-35.7' alternating clay/sand A/A to 35.7'	
			34.0-34.8' dark greenish gray to greenish black CLAY	
35	75% (split-spoon 08/20/2001)	250	34.8-35.6' dark greenish gray very fine to fine grained SAND w/ trace shells	
36			Attempt Geoprobe sample at 36-40', however, sand heave at 36'. Pull 2-inch rods, old gasoline-like odor on shoe observed by driller.	
37	100% (split-spoon)	200	36.0-36.4' dark greenish gray SAND	
			36.4-36.6' CLAY, color A/A	
38			36.6-37.5' SAND, color A/A, w/ trace shells	
			37.5-37.6' CLAY, color A/A	
39	100% (split-spoon)	420	37.6-38.0' SAND, color A/A, no odor throughout	
			38.0-38.4' SAND, color A/A	
40			38.4-38.8' CLAY color A/A	
			38.8-40.0' SAND color A/A	
41	100% (split-spoon)		40.0-42.0' greenish gray very fine to fine grained SAND, few to some silt	<p>Casing: 20 feet PVC 6-inch diameter installed on August 20, 2001, neat Portland cement grout</p> <p>Riser - 35 feet PVC 2-inch diameter</p> <p>Well screen - 5.0 feet PVC 0.010-inch slot</p> <p>Filter pack - No. 2 Hughes sand from 40.0 feet bgs to 34.0 feet bgs</p> <p>Annular seal - bentonite chips from 34.0 feet bgs to 31.5 feet bgs</p> <p>DSI Easy Grout (high solids bentonite) from 31.5 feet bgs to top of 6-inch casing (filled "T" mud pan riser)</p> <p>Casing installed using Mobile B-80 drilling rig, East Coast Drilling, Inc.</p> <p>Monitoring well using CME-45 drilling rig, East Coast Drilling, Inc.</p>
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MTR		Well Completion Log Monitoring Well PM-03B		Intermediate Remedial Pre-Design Characterization SCE&G CPA Site Management and Technical Resources, Inc.	
Total Depth: 32.5 ft. bgs		Casing installation observed by: D. Wingerd		Casing Drilling Method: 8 1/2-inch I.D. hollow stem augers (HSA)	
Date Started: 08/08/01		Casing installed by: R. Fowler, Cert. No. 01315		Well Drilling Method: Wash rotary w/ 5 1/8-inch bit/AW rod	
Date Completed: 08/10/01		Well installation observed by: D. Wingerd		Sampling Methods: Split-spoon ³	
Northing ¹ : 350,343.4		Well installed by: R. Fowler, Cert. No. 01315		Development Method: Surge and pump	
Easting ¹ : 2,329,899.5		Surveyed by: W. K. Dickson, No. 000177		LS Elevation ² : 7.22 feet msl ²	
		Well depth, feet TOC: 33.03		TOC Elevation ² : 7.00 feet msl ²	
DEPTH (feet)	REC. (%)	PID (ppm)	DESCRIPTION	COMMENTS	
1			0.0-0.4' asphalt		
2	80% (2.0' of 2.5')	0.5	0.4-0.8' GRAVEL and silty CLAY (subbase)		
3			0.8-1.0' asphalt		
4			1.0-1.25' GRAVEL and silty CLAY (subbase), (hand clear to 1.25')		
5	78%	0.5	1.25-1.85' brownish gray to brownish black silty fine grained SAND w/ some gravel		
6			1.85-2.65' greenish gray silty SAND w/ little shells, trace fine gravel		
7			2.65-2.85' black clayey SILT, dry, no odor		
8			2.85-3.25' dark greenish gray clayey SAND		
9	100%	0.0	4.0-4.15' dark gray clayey SAND, medium to fine grained w/ few coarse grained shell fragments		
10			4.15-4.4' brownish black to olive black clayey SAND w/ trace coarse grained shell fragments		
11			4.4-4.5' white to very light gray SHELLS w/ little clay		
12			4.5-4.6' brownish gray to moderate reddish brown silty SAND		
13			4.6-4.8' dark gray CLAY and SHELL fragments		
14			4.8-5.1' pale yellowish brown fine to coarse grained SAND w/ little shells and little well rounded pebbles		
15			5.1-5.4' brownish gray fine grained SAND w/ little pebbles, wet		
16			5.4-7.1' dark greenish gray CLAY w/ little vegetation, no odor		
17	88%	0.0	8.0-12.0' greenish black CLAY, moderately firm to moderately firm, trace vegetation to little vegetation at base, trace oyster-like shells, sandy clay at 10.8-10.9', salty anaerobic odor at base		
18			12.0-12.4' greenish black CLAY, soft to moderate soft		
19			12.4-12.5' greenish black clayey very fine grained SAND		
20			12.5-16.0' greenish black CLAY, trace shells, moderately soft		
21	100%	0.0	16.0-18.5' greenish black CLAY, moderately soft, sand lens at 16.5', trace oyster-like shell fragments at 18.0-18.5'		
22			18.5-19.5' greenish gray CLAY, firm to dense, w/ some clay and shells at base		
			no odor throughout		
			20.0-20.6' medium bluish gray CLAY, firm, dense, no odor		
			20.6-21.3' medium bluish gray CLAY and SHELLS		
			21.3-22.3' grayish olive to light olive brown CLAY and SHELLS, moderately soft		

¹ State Plane Coordinates (NAD 83)

² Elevation datum is NAVD 88 that are based on mean low sea level (to convert to RI datum, add 0.98')

³ Lithology description from PM-03 Geoprobe boring completed 06/22/01

MTR		Well Completion Log Monitoring Well PM-03B (cont.)		Intermediate Remedial Pre-Design Characterization SCE&G CPA Site Management and Technical Resources, Inc.	
DEPTH (feet)	REC. (%)	PID (ppm)	DESCRIPTION	COMMENTS	
23			22.3-23.8' moderate yellowish brown CLAY w/ some SHELLS, firm, firm, no odor	<p>No. 2 Hughes Filter Pack</p> <p>0.010-inch slot PVC Screen</p> <p>Well Total Depth 32.5' bgs</p>	
24			23.8-24.0' dark yellowish orange clayey SAND, no odor		
25	88%	0.7	24.0-24.8' moderate yellowish brown fine grained SAND, well sorted, soft, wet, no odor		
26			24.8-25.9' grayish orange fine grained SAND w/ some shell fragments grading to SAND and SHELLS, soft, wet to oversaturated		
27			25.9-26.7' moderately yellowish brown slightly silty SAND, well sorted		
28			26.7-27.2' moderately yellowish brown SAND, trace shell fragments and little shells		
29	100%	0.0	27.2-27.5' moderate yellow brown SAND, firm, moist, no odor		
30			28.0-29.0' dark yellowish orange to moderate yellowish brown very fine to fine grained SAND w/ few shell fragments, well sorted, slightly silty, firm		
31			29.0-30.4' moderate yellowish brown very fine to fine grained SAND w/ little shell fragments, slightly silty, well sorted, firm		
32			30.4-31.8' pale yellowish brown to moderate olive brown SAND, very fine to fine grained, w/ some shell fragments		
33	100%	0.0	31.8-32.0' moderate olive brown clayey SAND, no odor throughout	<p>Casing: 20 feet PVC 6-inch diameter Portland cement w/ 5% bentonite installed on 08/08/2001</p>	
34			32.0-33.2' greenish black to greenish gray CLAY w/ trace shells, trace shells, firm		
35			33.2-33.4' dark greenish gray clayey SAND		
36			33.4-35.4' dark greenish gray sandy CLAY		
37	100%	0.0	35.4-36.0' light olive gray clayey SAND		
38			36.0-36.2' light olive gray SAND, very fine to fine grained, well sorted	<p>Riser - 22.5 feet PVC 2-inch diameter Well screen - 10.0 feet PVC 0.010-inch slot Filter pack - No. 2 Hughes sand from 32.5 feet bgs to 20.7 feet bgs Annular seal - bentonite chips from 20.7 feet bgs to 18.6 feet bgs DSI Easy Grout (high solids bentonite) from 18.6 feet bgs to top of 6-inch casing</p>	
39			36.2-40.0' light gray to pale green very fine to fine SAND, well sorted and uniform		
40					
41	93%	0.0	40.0-43.7' medium light gray to light olive gray SAND, very fine to fine grained, well sorted w/ trace shell fragments, no odor		
42				<p>Casing installed using Mobile B-80 drilling rig, East Coast Drilling, Inc. Monitoring well installed using CME-45 drilling rig, East Coast Drilling, Inc.</p>	
43					
44					
45			Total depth of DPT boring at 44 feet bgs on 06/22/2001		
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47					
48					
49					
50					